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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|----------------------------------------------------------------------------------------------------------------------|-------------|----------------------|-----------------------|------------------|
| 10/585,559 | 03/05/2008 | Youness El Ouair | 3103.04WOUS | 4220 |
| 24113 | 7590 | 12/16/2010 | EXAMINER | |
| PATTERSON THUENTE CHRISTENSEN PEDERSEN, P.A. 4800 IDS CENTER 80 SOUTH 8TH STREET MINNEAPOLIS, MN 55402-2100 | | | FREJD, RUSSELL WARREN | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2128 | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/585,559 | EL OUAIR ET AL. | |
| | Examiner | Art Unit | |
| | Russell Frejd | 2128 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 07 September 2010.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-37 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-32,35,36 and 37 is/are rejected.
 7) Claim(s) 33 and 34 is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 03 April 2008 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>7/7/06, 9/7/10</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: _____ |

Examination of Application #10/585,559

1. Claims 1-37 of application 10/585,559, filed on 5-March-2008, are presented for examination.

Specification Objections

2. The disclosure is objected to because of the absence of headings describing the various sections of the specification.

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.

- (1) Field of the Invention.
- (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A “Sequence Listing” is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required “Sequence Listing” is not submitted as an electronic document on compact disc).

Claim Rejections under 35 U.S.C. § 112, 2nd Paragraph

3. Claims 19, 22, 23, and 36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The following is a list of the specific rejections:

In regard to claim 19, the phrase “the prior knowledge” [ln. 2] lacks antecedent basis.

In regard to claim 22, the phrase “the posterior expectation” [ln. 3] lacks antecedent basis.

In regard to claim 23, the phrase “the posterior covariance” [ln. 3] lacks antecedent basis.

In regard to claim 36, the phrase “claimed in anyone of claim 1” is vague due to an apparent grammatical error.

Notice - 35 U.S.C. § 112, Sixth Paragraph

4. The following is a quotation of the appropriate paragraph of 35 U.S.C. 112 that forms the basis for the notice under this section made in this Office Action:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

4.1 The language of claim 37 indicates Applicants may desire an interpretation of these claims under 35 U.S.C. § 112, Sixth Paragraph. In order to receive a claim interpretation under 35 U.S.C. § 112, Sixth Paragraph, Applicants must:

1. show why the claim language properly invokes 35 U.S.C. § 112, Sixth Paragraph;
2. identify the function;
3. identify the corresponding structure; and
4. amend the Specification, if necessary, to explicitly state what structure corresponds to the recited function with reference to the claimed terms and phrases, provided no new matter is introduced.

See 37 C.F.R. 1.75(d) and MPEP § 2181.

4.2 For the purpose of further examination, each claim listed above will be interpreted as broadly as reasonably possible without regard to 35 U.S.C. § 112, Sixth Paragraph.

Claim Rejections under 35 U.S.C. § 101

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title.

5.1 Claims 1-32, 35 and 37 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

5.2 The Examiner respectfully posits that claims 1-32 of the present invention do not meet the criteria for a statutory process, because the claims are determined to be a method for processing seismic data representing a physical system, wherein the method converts one set of numbers (i.e. the difference between first and second seismic data) into another set of numbers (the inverted difference), whereby the method does not manipulate appropriate subject matter, and thus cannot constitute a statutory process (MPEP Section 2106.02). The examiner respectfully notes that the seismic data is not specifically claimed as “first and second measurements” of seismic data, and therefore the seismic data could reasonably be interpreted as mere numbers to be manipulated by the present inversion process.

5.3 The Examiner also posits that claim 37 of the present invention could be reasonably interpreted as computer executable software code or a program per se, consisting of a machine-readable medium having software instructions that implement the method for processing data representing a physical system. The examiner respectfully notes that the specification states, “The data inversion methods described above may be embodied in a program for controlling a computer to perform the inversion” [p. 13, ln. 6]. In view of this statement, and the fact there is no specific hardware reference in the claim language, the

software instructions of claim 37 do not meet the criteria for a statutory process (MPEP Section 2106.01).

5.4 Furthermore, claim 35 is determined to not meet the criteria for a statutory process due to the description on page 13 of the specification, wherein the claim describes a carrier wave that encodes a data signal (i.e. “The program may also be transmitted across a computer network...”). In view of the guidelines for 101 subject matter, the “transmission of a program” of claim 35, having software for processing seismic data representing a physical system, does not manipulate appropriate subject matter, and thus cannot constitute a statutory process under 35 U.S.C. § 101.

5.5 In regard to claims 1-36, and in view of the memorandum from Andrew Hirshfeld dated 24-August-2009, and the memorandum from Robert Bahr dated 27-July-2010, a § 101 process must: (1) be tied to another statutory class (such as a particular machine or machine implemented apparatus), or (2) transform underlying subject matter (such as an article or materials) to a different state or thing. If neither of these requirements is met by the claim, the method is not a patent eligible process under § 101, and is therefore non-statutory subject matter. It is noted that, using the broadest reasonable interpretation of the claim, a machine or transformation can be either explicitly or inherently present in the claim, in order to qualify as a § 101 statutory process. It is only if no machine or transformation is present, either explicitly or inherently, that the claim should be rejected as being directed to non-statutory subject matter, and therefore does not qualify as a statutory process.

Specifically in regard to independent claim 1, at least the step for “obtaining changes in the parameters of the model” inherently requires the use of a machine, as it cannot be

reasonably accomplished without the use of a computer. Furthermore, the specification states that, "The data inversion methods described above may be embodied in a program for controlling a computer to perform the inversion" [p. 13, ln. 6]. For this reason, claims 1-36 qualify as a statutory process for being inherently tied to a particular machine.

Claim Objections

6. Claims 33 and 34 are objected to for being dependent upon rejected base claim no. 1.

Allowed Claims

7. Claims 1-37 are deemed allowable over the prior art of record at this time, pending resolution of any rejections noted above, because the prior art does not specifically claim:

"forming a difference between first and second seismic data representing the system in first and second states, respectively; and

inverting the difference in accordance with a parameterised model of the physical system to obtain changes in the parameters of the model."

Working on difference data rather than inverting the measured data prior to taking the difference is advantageous with respect to uncertainty estimation in that it allows a correct quantitative statistical treatment of the uncertainties, eliminating the need for qualitative interpretation.

Response Guidelines

8. A shortened statutory period for response to this action is set to expire **3 (three) months and 0 (zero) days** from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned (see MPEP 710.02, 710.02(b)).

- 8.1 **Any response to the Examiner in regard to this non-final action should be**

directed to: Russell Frejd, telephone number (571) 272-3779, Monday-Friday from 0530 to 1400 ET, **or** the examiner's supervisor, Kamini Shah, telephone number (571) 272-2279. Inquires of a general nature or relating to the status of this application should be directed to the TC2100 Group Receptionist (571) 272-2100.

mailed to: Commissioner of Patents and Trademarks
P.O. Box 1450, Alexandria, VA 22313-1450

or faxed to: (571) 273-8300

Hand-delivered responses should be brought to the Customer Service Window, Randolph Building, 401 Dulany Street, Alexandria, VA, 22314.

/Russell Frejd/
Primary Examiner AU 2128